



**State of Louisiana
Coastal Protection and Restoration Authority**

2016 Annual Inspection Report

for

**Lake Borgne Shoreline Protection
Project**

State Project Number PO-30
Priority Project List 10

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St. Bernard Parish

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for
Lake Borgne Shoreline Protection Project
(PO-30)**

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I. Introduction

Construction of the Lake Borgne Shoreline Protection project was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning Protection and Restoration act (CWPPRA) enacted on November 29, 1990 as amended. The Lake Borgne Shoreline Protection project was approved on the 10th Priority Project List. A second Lake Borgne Project was approved on the 11th Priority Project List and was subsequently combined with the previously approved Lake Borgne project.

A site map showing the project boundary is shown in Attachment II along with a map identifying all of the project features within the project area.

II. Project Description and History

The initial project provided lakeside protection only to the Old Shell Beach area. In April 2002, the Task Force combined the original project and funding with the Lake Borgne Shoreline Protection at Bayou Dupre (PO-31) from Priority Project List 11. The combined project (PO-30) is divided into two sections, Bayou Dupre and Shell Beach. The section at Shell Beach extends approximately 3.4 miles between Fort Bayou and Doulluts Canal, and the section at Bayou Dupre extends approximately 1.5 miles to the west and 0.8 miles to the east of Bayou Dupre (Figure 1).

The principal project features include a rock breakwater along the designated shoreline sections of Lake Borgne at Bayou Dupre and Shell Beach. At the mouth of Bayou Dupre, maintenance dredging within the MRGO has created an unnatural water depth. Therefore, a sheet pile structure ties in the shoreline breakwater into the existing offshore USACE rock breakwater along the MRGO. At Shell Beach, the rock breakwater ties in to the existing rock breakwater which surrounds the perimeter of Fort Beauregard and the only openings in the breakwater will occur along the mouth of Bayou Yscloskey and across the Tennessee Gas Pipeline right-of-way. Reach 1, extending to the north of Bayou Dupre, and the portion of Reach 3 between Fort Bayou and Bayou Yscloskey, were identified during design as having relatively weak soil foundation conditions compared to the rest of the project. These “weak” areas were designed to be placed in two (2) lifts during the initial construction contract followed by a maintenance lift approximately one (1) year later.

Construction began on August 1, 2007. The breakwater alignment was realigned in the field to conform more closely to the new shoreline location that resulted from the land losses that were accelerated by Hurricane Katrina. The second lifts were placed on the weak sections in August 2008 however, before the Access and Flotation channels could be backfilled, storm surges from Hurricanes Ike and Gustaf inundated the area and resulted in the sinking a large portion of the Reach 1 rock breakwater. Two (2) short sections of Reach 3 “weak” were also affected. It was decided to address the issue during

the planned maintenance lift after an effective solution could be worked out. The project was accepted on March 11, 2009. Additional funding was first requested September 23, 2010 and authorized by the CWPPRA Task Force on May 5, 2011. A Permit modification and extension was applied for January 5, 2012 and was received from USACE May 22, 2012. The Maintenance Lift project was constructed with Notice-to-Proceed issued June 4, 2013 and the Notice-of-Acceptance issued September 11, 2014. The maintenance project consisted of placing a rock lift in Reaches 1 and 3(weak) and installing a composite sheetpile wall in the areas where rock had sunk in those reaches.

Annual project inspections are planned. The Project has twenty-year (20 year) economic life, which began in 2012.

III. Inspection Purpose and Procedures

The purpose of the annual inspection of the Lake Borgne Shoreline Protection Project (PO-30) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, OCPR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (O&M Plan). The annual inspection report also contains a summary of maintenance projects and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C. A summary of past operation and maintenance projects completed since completion of the project are outlined in Section II.

An inspection of the Lake Borgne Shoreline Protection Project (PO-30) was conducted on May 26, 2016, by Peter Hopkins and Jonathan Sherwood of CPRA, and Adrian Chavarria of EPA. There was a light wind and partly cloudy skies. The water level was approximately +1.5' MLW, estimated by observation relative to project features. Photographs of that inspection are included in Appendix B of this report.

IV. Inspection Results

Rock Breakwater

Reach 1 – Shortly after construction and the passage of Hurricanes Ike and Gustav the rock breakwater settled below the mudline for much of its length. The 2013 maintenance project placed a rock lift in reach 1 and installed a composite sheetpile wall in the areas where rock had settled below the mudline. Most of the rock was in good condition with only small localized area of minor settling (N29d 57m 17.70s). Most of the composite sheetpile wall was in good condition except for 2 areas that were damaged and no longer functioning as a breakwater. One area near, Bayou Dupre, was approximately 330' long (N29d 56m 54.85s, W089d 50m 31.18), and two smaller areas about one quarter of a mile northward (N29d 57m 35.35s, W089d 50m 50.53s).

In the area near, Bayou Dupre, soundings were taken with a bamboo pile for a length beyond the damaged area. These soundings revealed that the scour protection in the damaged area had settled to a depth of about 10 to 12 feet and was about 7 feet deep in the undamaged areas beyond. In the damaged area, this is significantly deeper than the design depth for the wall.

A follow-up inspection was conducted on January 5, 2017 to take additional soundings in all of the damaged areas and to observe if the extent of the damage was increasing. The water level was approximately +1.0' MSL (by the tide gage at the Bayou Bienvenue lift bridge/flood gate and by observation relative to the project structures). The soundings were similar in the area near Bayou Dupre and the two smaller areas. However the two smaller areas appeared to have grown in length, possibly due to the greater visibility allowed by a lower water level than at the previous inspection.

Reaches 2, & 3(strong) - The breakwater reaches appear to be in good condition, except for limited areas that have settled and should be monitored for possible future action.

Reach 2 Approximately 100' near N29d 56m 30.66sec.

Reach 3 (strong). Approximately 100' at mouth of Fort Bayou

Approx. 60' @N29.87200, W089.70061

Approx. 100' @ N29.87011, W 089.69653

Approx. 50' @N29.86959, W089.69527

Approx. 800' from N29.86876, W089.69313, to Tennessee Gas Pipeline no construction zone

Reach 3 Weak –The rock breakwater received a lift during the 2013 maintenance project and appeared to be on good condition. The 2013 maintenance project installed a composite sheetpile wall in the two areas where rock had settled below the mudline. These composite sheetpile walls were in good condition.

Reach 4 - The breakwater reach appear to be in good condition.

Double Sheetpile Wall Breakwater

The Double Sheet-pile Wall Breakwater appear to be in good condition. Although there are some sections of settlement and some corrosion of the steel in the splash zone it is performing its function.

Warning Signs

The two (2) warning signs at the Reach 1 Double Sheet-pile Wall Breakwater are present and appear to be in good condition. The Warning Sign at the Reach 2 Double Sheet-pile Wall Breakwater was replaced in the 2013 maintenance project and is in good condition.

V. Conclusions

Except for Reach 1 and isolated sections of Reach 3 Weak, The Lake Borgne shoreline Protection Project (PO-30) is performing as intended. The scheduled Maintenance Project is planned to address the gaps in the Reach 1 and Reach 3 Weak breakwaters and replace the missing warning sign at the Reach 2 Double Sheet-pile Wall Breakwater.

VI. Recommendations

Immediate Repairs

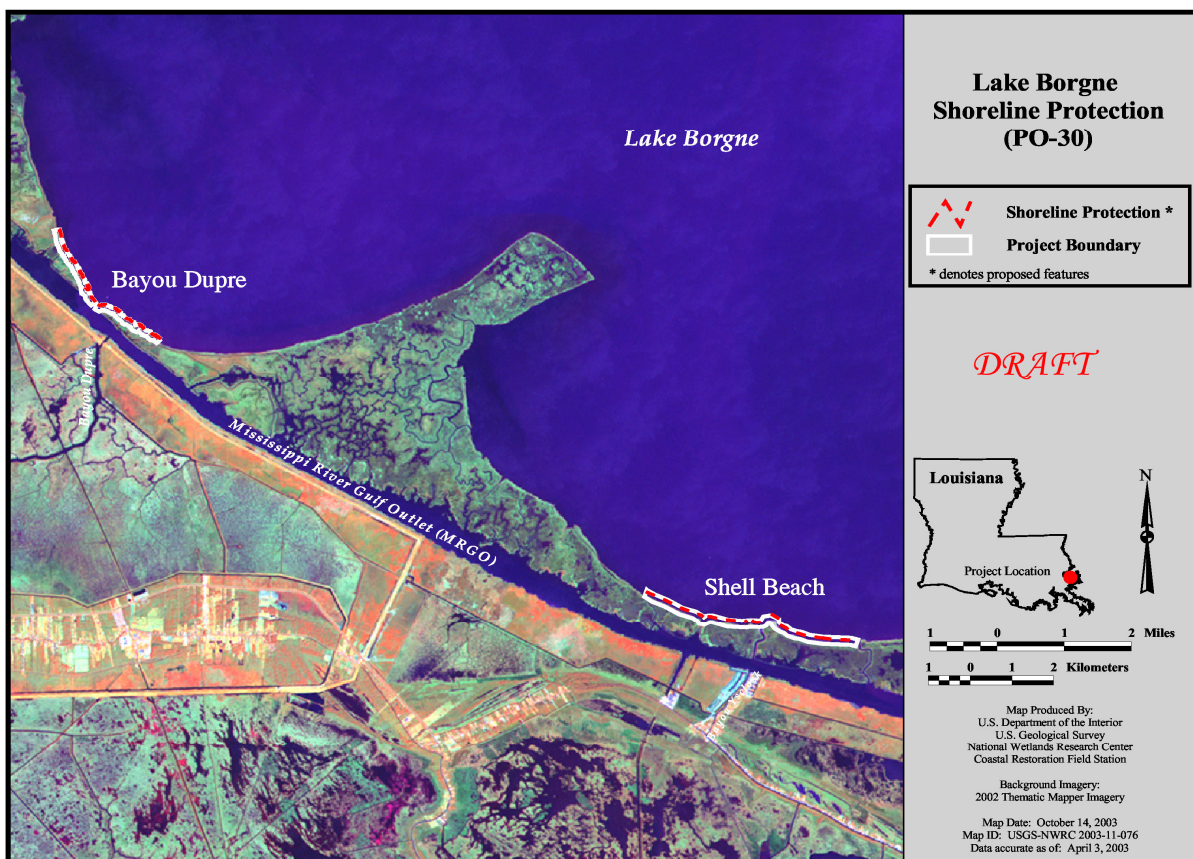
- A maintenance project is scheduled for this year to address the gaps in Reaches 1 and 3 Weak along with the settlement anticipated during design. The missing warning sign at Reach 2 Double Sheet-pile Wall Breakwater will also be replaced.

Programmed Maintenance

- Continue to monitor the condition of the breakwaters.

Appendix A

Project Features Map



Appendix B

Photographs



Reach 1 – Rock Breakwater Settlement



Reach 1- Damaged Sheetpile Wall



Reach 2 – Rock Breakwater Settlement



Reach 3 Strong – Rock Breakwater Settlement



Double Sheetpile Wall Breakwater

Appendix C

Three Year Budget Projection

Lake Borgne Shoreline Protection - PO-30																									
Federal Sponsor: EPA																									
Construction Completed : XXXX						State O&M	\$6,658,041	\$93,351	\$5,282										1			5			
PPL 10						Corps Admin	\$5,436	\$2,480	968										2			6			
						Federal S&A	\$136,170	\$2,335	\$1,204										3			7			
							\$6,799,647	\$6,897,813	\$6,905,267										4			8			
							\$776					968													
Current Approved O&M Budget				Year 0	Year - 1	Year -2	Year -3	Year -4	Year -5	Year -6	Year -7	Year -8	Year -9	Year -10	Year -11	Year -12	Year -13	Year -14	Year -15	Year -16	Year - 17	Year -18	Year -19	Project Life	Currently
				FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	Budget	Funded
State O&M				\$0	\$6,646,735	\$5,565	\$5,741	\$4,790	\$4,951	\$88,400	\$5,282	\$5,453	\$5,628	\$5,806	\$5,988	\$6,174	\$6,363	\$88,400	\$6,755	\$6,957	\$7,163	\$7,373	\$7,588	\$6,921,112	\$6,756,674
Corps Admin				\$729	\$744	\$760	\$776	\$792	\$809	\$826	\$843	\$861	\$879	\$897	\$916	\$935	\$955	\$975	\$996	\$1,017	\$1,038	\$1,060	\$1,082	\$17,890	\$8,884
Federal S&A				\$1,041	\$132,935	\$1,086	\$1,108	\$1,132	\$1,155	\$1,180	\$1,204	\$1,230	\$1,256	\$1,282	\$1,309	\$1,336	\$1,364	\$1,393	\$1,422	\$1,452	\$1,483	\$1,514	\$1,547	\$157,429	\$139,709
Total				\$1,770	\$6,780,414	\$7,411	\$7,625	\$6,714	\$6,915	\$90,406	\$7,329	\$7,544	\$7,763	\$7,985	\$8,213	\$8,445	\$8,682	\$90,768	\$9,173	\$9,426	\$9,684	\$9,947	\$10,217	\$7,096,431	\$6,905,267
Current Funded O&M Budget	Year 4	Year 3	Year 2	Year 0	Year - 1	Year -2	Year -3	Year -4	Year -5	Year -6	Year -7	Year -8	Year -9	Year -10	Year -11	Year -12	Year -13	Year -14	Year -15	Year -16	Year - 17	Year -18	Year -19	Project Life	Currently
Per \$BYFY spreadsheet	FY06	FY07	FY08	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	Budget	Funded
State O&M	\$2,419,098.00	\$1,038,506.00		\$0	\$3,200,437	\$0	\$4,790	\$88,400	\$5,282	\$88,400	\$5,282	\$5,453	\$5,628	\$5,806	\$5,988	\$6,174	\$6,363	\$88,400	\$6,755	\$6,957	\$7,163	\$7,373	\$7,588	SUM(E17:X17)	\$6,756,513
Corps Admin	\$3,190.00	\$776.00	\$1,601.00	\$0	\$826	\$0	\$1,132	\$1,704	\$968	\$826	\$843	\$861	\$879	\$897	\$916	\$935	\$955	\$975	\$996	\$1,017	\$1,038	\$1,060	\$1,082	SUM(E18:X18)	\$10,197
Federal S&A	\$3,009.00			\$0	\$132,980	\$0	\$0	\$1,180	\$1,204	\$1,180	\$1,204	\$1,230	\$1,256	\$1,282	\$1,309	\$1,336	\$1,364	\$1,393	\$1,422	\$1,452	\$1,483	\$1,514	\$1,547	SUM(E19:X19)	\$138,373
Total	\$2,425,297	\$1,039,282	\$1,601	\$0	\$3,334,243	\$0	\$5,922	\$91,284	\$7,454	\$90,406	\$7,329	\$7,544	\$7,763	\$7,985	\$8,213	\$8,445	\$8,682	\$90,768	\$9,173	\$9,426	\$9,684	\$9,947	\$10,217	\$0	\$6,905,083
	\$2,425,297	\$3,464,579	\$3,466,180	\$3,466,180	\$6,800,423	\$6,800,423	\$6,806,345	\$6,897,629	\$6,905,083																
Projected O&M Expenditures						1.031701891	1.03162624	0.834349416	1.033611691	1.03352858	1.032245	1.032374	1.032092	1.031628	1.03135	1.031062124	1.0306122	1.030489	1.030197	1.029904	1.02961	1.029317	1.02916045	Remaining Project Life	Current Budget
Maintenance Inspection				0	5394	5565	5741	\$4,790	\$4,951	\$5,117	\$5,282	\$5,453	\$5,628	\$5,806	\$5,988	\$6,174	\$6,363	\$6,557	\$6,755	\$6,957	\$7,163	\$7,373	\$7,588	\$83,087	\$83,087
General Maintenance																								\$0	\$0
Surveys																								\$0	\$0
Sign Replacement										\$83,283								\$81,843						\$165,126	\$165,126
Federal S&A				1041	1062	1086	132981	\$1,132	\$1,155	\$1,180	\$1,204	\$1,230	\$1,256	\$1,282	\$1,309	\$1,336	\$1,364	\$1,393	\$1,422	\$1,452	\$1,483	\$1,514	\$1,547	\$17,792	\$17,792
Maintenance/Rehabilitation																								\$0	\$0
E&D							\$379,652											\$0						\$0	\$0
Construction							6020857																	\$0	\$0
Construction Oversight							\$240,834											\$0						\$0	\$0
Total				1041	6456	6651	6780065	\$5,922	\$6,106	\$89,580	\$6,486	\$6,683	\$6,884	\$7,088	\$7,297	\$7,510	\$7,727	\$89,793	\$8,177	\$8,409	\$8,646	\$8,887	\$9,135	\$266,005	\$266,005
O&M Expenditures from COE Report							\$2,589	3/21/2016 Lana			Current O&M Budget less COE Admin						\$7,078,541		Current Project Life Budget less COE Admin						\$7,078,541
State O&M Expenditures not submitted for in-kind credit							\$5,652,964	2/16/2017 LaGov PBEC			Remaining Available O&M Budget						\$1,422,988		Total Projected Project Life Budget						\$5,921,558
Federal Sponsor MIPRs (if applicable)											Add'l Funding amount needed thru FY17-FY20						-\$1,156,983		Project Life Budget Request Amount						-\$1,156,983
Total Estimated O&M Expenditures (as of April 2010)							\$5,655,553																		

Appendix D

Field Inspection Form

MAINTENANCE INSPECTION REPORT CHECK SHEET

Project No. / Name: PO-30 Lake Borgne Shoreline Protection Project

Date of Inspection: **5/26/2016** Time: **9:30 am**

Structure No. _____

Inspector(s): **Hopkins, Sherwood, Chavarria**

Structure Description: _____

Water Level

Outside: **+.115@ MSL Shell Beach NOAA 12noon**

Type of Inspection: Annual

Weather Conditions: **Sunny, light wind**

Item	Condition	Physical Damage	Corrosion	Photo #	Observations and Remarks
Rock Breakwater Reach 1	Good to bad	None	N/A		approximately 3800' of breakwater submerged during Hurricanes Gustaf and Ike during construction in 2008.
Rock Breakwater Reach 2	Good	None	N/A		
Rock Breakwater Reach 3	Good to bad	None	N/A		two areas that began to submerge during construction have continued to sink through Hurricanes Gustaf and Ike and after are now approximately 400' long
Rock Breakwater Reach 4	Good	None	N/A		
Double Sheet-pile	Good	None	light		The fill between the double sheetpile walls has settled about 1' in places
Warning Signs	2 good 1 missing	1 missing	N/A		The warning sign for the Reach 2 sheetpile structure is missing.

Are there any signs of vandalism? No

Conditions of existing containment dikes? Good